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Yanagisawa et al.

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[54] **MULTIPLE STACKED DOCKING STATIONS
AND PORTABLE COMPUTER**

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[52] **U.S. Cl.** **361/686; 395/280**

[58] **Field of Search** 395/280, 281;
361/683-686, 725-727

[56] **References Cited**

U.S. PATENT DOCUMENTS

5,123,092	6/1992	Buxton et al.	395/250
5,396,400	3/1995	Register et al.	361/686
5,434,743	7/1995	Hosoya et al.	361/686
5,436,792	7/1995	Leman et al.	361/686
5,457,785	10/1995	Kikinis et al.	395/308
5,459,637	10/1995	Ma et al.	361/686
5,463,742	10/1995	Kobayashi	395/281
5,491,609	2/1996	Dankman et al.	361/686
5,493,542	2/1996	Odelid	364/708.1
5,526,493	6/1996	Shu	395/281
5,535,093	7/1996	Noguchi et al.	361/686

5,579,528	11/1996	Register	395/200.12
5,598,537	1/1997	Swanstrom et al.	395/281
5,598,539	1/1997	Gephardt et al.	395/281
5,619,659	4/1997	Kikinis et al.	395/281
5,627,728	5/1997	Ma et al.	361/686

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[57] **ABSTRACT**

A docking station adapted to a portable computer has a first docking unit, which can be mechanically coupled with the portable computer, including a first connector for electrically connecting with the portable computer, more than one connection port provided for the respective port signal lines that run from the first connector, and a second connector for directly passing through bus signal lines that run from the first connector; and a second docking unit, which can be mechanically coupled with the first docking unit, including a third connector for electrically connecting with the second connector, space for retaining a peripheral device connected to a bus expanded through the third connector, and at least one bus slot to connect an expansion adaptor card to the bus expanded through the third connector. The assemblage of the first and the second docking units with the portable computer comprise a docking station complex of vertically stacked units which are mechanically coupled and electrically connected to provide a substantially unitary structure. The electrical connectors between the units are arranged to mechanically connect in opposite horizontal directions to mechanically bind the docked units and to provide the unitary structure to the docking station complex.

11 Claims, 12 Drawing Sheets

